DOCUMENT RESUME

ED 266 630 FL 015 444

AUTHOR Culhane, Terry
TITLE Microcomputers and Language Testing.
PUB DATE 85
NOTE 7p.; In: Practice and Problems in Language Testing 8. Papers presented at the International Language Testing Symposium of the Interuniversitare Sprachtestgruppe (IUS) (8th, Tampere, Finland, November 17-18, 1984); see FL 015 442.
PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Authoring Aids (Programing); *Computer Assisted Testing; Courseware; Foreign Countries; Independent Study; *Language Tests; *Microcomputers; Programing Languages

ABSTRACT

Many commericially available computer programs contain test-type materials, and some courseware makes use of testing techniques as an instructional device. The area in which testing techniques are used most effectively for teaching is self-instruction. Most microcomputers operate using the BASIC language, but authoring languages are the most easily used by teachers. EXTOL, an authoring aid developed at the University of Essex (England) specifically for language teaching, has powerful testing capabilities. EXTOL uses a driver program written in PASCAL or FORTRAN, contains only 17 commands, has been used to develop multiple-choice and cloze tests, and can report the current score of correct answers to the student. The unique qualities of computers can be of use in testing in a variety of other ways, including investigating the relationship of lexical availability and cloze test performance, speed of response, speed of comprehension, and availability of structures for productive purposes. The EXTOL commands are appended. (MSE)

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MICROCOMPUTERS AND LANGUAGE TESTING

Terry Culhane (University of Essex)

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Computing and Language Teaching

The art of program writing and the art of language teaching came together many years ago with PLATO and such devices, which were dependent on large-scale "main-frame" machines[1]. Smaller computers, such as, for example, the one at the University of Surrey, were devoted entirely to the teaching process, and programs such as those devised by G.Corbett,K. Ahmad and others for the teaching of Russian numerals[2]. The microcomputer revolution, with its rapidly increasing versatility, availability and accessibility, inevitably increased the range of programs available. Some of these, such as the Carbondale Russian Irregular Verbs and French Irregular Verbs are encyclopaedic, comprehensive and rather traditional in their approach. They are, nevertheless, very effective in the classroom. Students seem to like the stimulus brought on by the interaction between themselves and the TV screen. It is inevitable that many of the early programs used a "programmed learning type of approach, and that many of the testing devices used were of the multiple-choice type. Cloze tests, gap-filling exercises and "storyboard" are also favourite exercises, and some software firms, such as WIDA[3], provide so-called "authoring" packages, which enable the teacher to write his own material. It is likely that these popular and effective techniques will be complemented by programs devoted to "information gathering" and language games, such as the highly imaginative "Jeu de ménages" and "Quelle tête" of Barry Jones [4]. Many of the programs being produced for the latest BBC French series have features not previously seen in language teaching software. These will be available later this year and contain about 45 language teaching programs by Mike and Marie-Madeleine Kenning[5].

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There are, of course, many ways in which a computer can be used in the classroom. Many teachers have used the computer as a source of information which the student can refer to when appropriate. This technique is popular in primary schools, where the children have to gather information from several different sources, and is often used with children working in small groups. A second method is to use the computer as a source of stimulus for the whole class. "Storyboard" and "Crossword" are particularly good for this purpose. The most potent use of the micro-

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computer is likely to be for self-instructional purposes, or, at least, using self-instructional techniques in small groups.

Self-instructional techniques and testing

Many commercially available programs contain materials of a "testing" nature. The WIDA vocabulary programs, for example contain multiple choice tests of vocabulary. These would not pass scrutiny as tests, since their distractors are drawn at random from sets of words at different levels. Other self-instructional materials[6] make extensive use of "testing" as a teaching device. The validity of such tests should be estimated on the basis of their success as teaching materials, and not using criteria intended for the validation of tests proper. Self-assessment is there in order to satisfy the person being assessed, who is both examiner and examinee, and if devices are didactically effective they may be said to have met the criteria for which they were devised. In other words they have the only kind of validity they need. Courses which rely on information gathering techniques based on comprehension can claim high "authenticity", incidentally, and if teaching and testing go hand in hand, the branch of teaching known as self-instruction is the one closest to testing. It is here that testing techniques are given maximum effect as teaching devices.

BASIC and the Teacher

Most microcomputers operate using a language called BASIC, and all of the programs quoted above are written in that language. We at Essex run two courses in CALT for our MA students in Applied Linguistics, and this year we have successfully run a course in the Certificate of Applied Linguistics and the teaching of English (CALTE). We have discovered through (sometimes painful) experience, that not all students are capable of writing computer programs of great sophistication. All of them succeed to some extent, but the amount of time needed to write programs of publishable standard is greater than the average teacher is prepared to spend. I do not wish to discourage anyone from attempting to write programs in BASIC. Quite the reverse! The least that you will learn from the process is that the medium has its virtues and its limitations, and that different computers have their own variations of BASIC "built-in" to their operating systems. There are, however, easier ways of learning to program than by learning BASIC. One is through an "author" language specially devised to act as an interface between the teacher and the computer. There are several such languages, and we have one of them at Essex. It is used on two of the courses mentioned above.

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EXTOL

The language EXTOL[7] was invented by Dr. M. Kenning of the University of Essex and his wife, who teaches at the University of East Anglia. Within four hours the more able students are writing teaching programs. The language uses a "driver" program written in PASCAL or FORTRAN and is purpose-built for language teaching. It is also a very powerful testing device, and I would like to show you how it works and how we intend to use it.

EXTOL, like BASIC, works through a program line by line from the top. It looks at the first character in each line and the nature of that character determines what the computer does. There are four types of line, and therefore four characters to distinguish them. I shall describe them by writing a program for you. The marker % indicates a comment line which is ignored by the computer and which is there to help the program writer remember what he has done. Here we go:-

```
%Remember that this line is ignored. I am now going
%to tell the computer to put something on the screen.
%I do this by leaving a letter in the first space.
What is the capital city of Finland?
%The above is a "text" line. We now want to accept
%whatever the student puts in. We do this with a
%"command" line, which starts with a dot.
.accept
%Now you want to compare his answer with the correct
%one. You do this with another command.
.match(1,1).Helsinki.
%This means if he gets it right put one in counter 1.
%Then we send the computer to counter 1 (there are
%nine such counters. If it discovers one in there it
%knows that the student answered "Helsinki". If there
%is nothing in there, he did not. We do all of this
%with one instruction-
.goto(1)..good.
%This means if he got it right jump to a "label" line
%called good and go on from there. A label line is
%marked with a colon in the left-hand column. If he
%gets it wrong he falls through to the next line.
I'm sorry, but you got it wrong.
%If you wanted to, you could send him back to the
%beginning by another "goto" line and another label
%line. Or you could stop him, like this:-
.stop
%We gets to the following line if he got it right:-
:good
Well done! Ask the teacher for your prize!
.stop
```

EXTOL has seventeen commands only. It is possible to

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score a student's performance in a test by using the command .increment(5,1). This would increase the value of counter 5 by one. Any one of the nine counters may be used and the teacher has the choice of whether or not to inform the student of his score. Student responses are also recorded in a "response" file, which is not accessible to the student. A full list of EXTOL commands is in Appendix A. We have constructed multiple-choice, gap-filling, cloze tests and even C-tests using EXTOL. Here is an example of how EXTOL can be used in a multiple-choice test.

```
.response lulu
.reset(1)
.reset(2)
.define.multi.
<Q>
<1>
<2>
<3>
<4>
.accept
.match(1,1).<ANS>
.goto(1)..inc.
.exit
:inc
.increment(2,1)
.end
.perform.multi.
Q=He used to go fishing once a week, but he ... now
1=A is almost never going
2=B is never going
3=C never goes
4=D never is going
ANS=C
.perform.multi.
Q=Never...him looking so ill.
1=saw I
2=I have seen
3=have I seen
4=I saw
ANS=C
Well done, you got
.print(2)
right
.stop
```

The above program will present a question as often as the command .perform.mult. is repeated and new parameters (questions and answers) are fed into the computer. The student's responses are stored in a file called "lulu", and in this variant the student is told his score. This example was written for purposes of illustration. We also have a series of tests written in EXTOL which are more

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sophisticated and which make much better use of the medium. Most of these are variations on the cloze technique and we hope to report on them at some future conference.

Other Ways in which Computers might Help Testing

It would be a wasted opportunity simply to feed into computers multiple-choice tests, cloze tests and the like, and use the machines as vehicles for existing methods. One of the virtues of computers is that they give us the opportunity of presenting our test material in a new way, by giving the student as much as we want for the length of time we want him to be exposed to it. This in itself should give rise to new ways of testing. The way in which we process the students' responses might also be different. Computers will enable us to test aspects of language we have so far not been able to test. The experiment at Essex mentioned above is attempting to find out something about the relationship of lexical availability and performance in cloze tests. Other factors which come to mind include speed of response, speed of understanding, availability of structures for productive purposes. All of these might well be investigated using microcomputers. Teachers and testers should be asking themselves the question, "What can I test with a computer that I cannot test by other means?" It is possible that the answer to this question could provide the most exciting advances in knowledge about how we learn languages that we have had in our lifetime.

APPENDIX A

Commands in EXTOL

.ACCEPT	Accept input from keyboard
.DEFINE.drill.	First line of exercise called "drill"
.END	Last line of above exercise
.EXACT	Set matching to accept as correct exact response from student
.EXIT	EXIT from drill or exercise
.FEED(5)	Type 5 (or more if you wish) blank lines to screen
.GOTO(1)..XXX.	If the value of counter 1 (there are 9 such counters) is zero carry on to the next line. If it is not zero go to a label called XXX
.HELP filename	Specify name of "help" file
.INCREMENT(1,1)	Add 1 to value of counter 1
.KEYWORD	Set matching to keyword mode
.MARK	Save current value of score counters in response file
.MATCH(1,1).ans1.ans2.	If answer 1 or answer 2 occurs as student input add 1 to the value of counter 1
.PERFORM.dril.	Perform an exercise (or test, etc.) called "dril"

.PRINT(1)	Print the value of counter 1 on the screen
.RESET(1)	Set the value of counter 1 to 0
.RESPONSE filename	Specify the name of the response file
.STOP	Stop the lesson

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